IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Appellants:	**Stephen J. Zack et al.**	Case:	**SEDN/198**
Serial No.:	**09/458,322**	Examiner:	**S. Huynh**
Filed:	**December 10, 1999**	Group Art Unit:	**2623**
Confirmation #:	**8722**		

Title: **METHOD AND APPARATUS FOR PROVIDING IN-BAND MESSAGING WITHIN A VIDEO ON DEMAND ENVIRONMENT**

MAIL STOP APPEAL BRIEF-PATENTS
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SIR:

APPEAL BRIEF

Appellants submit this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 2623 mailed March 16, 2007 finally rejecting claims 32-44.

In the event that an extension of time is required for this appeal brief to be considered timely, and a petition therefor does not otherwise accompany this appeal brief, any necessary extension of time is hereby petitioned for.

The Commissioner is authorized to charge the Appeal Brief fee ($250) and any other fees due to make this filing timely and complete (including extension of time fees) to Deposit Account No. 20-0782/SEDN/198.

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Real Party in Interest

The real party in interest is SEDNA PATENT SERVICES, LLC.

Related Appeals and Interferences

Appellants assert that no appeals or interferences are known to Appellants, Appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 32-44 are pending in the application. Claims 1-10 were originally presented in the application. Claims 11-44 were added by amendment. Claims 1-31 were cancelled without prejudice. Claims 32-44 stand finally rejected as discussed below. The final rejection of claims 32-44 is appealed.

Status of Amendments

The amendments in Appellants' 37 CFR 1.116 were not entered. Otherwise, all claim amendments have been entered.

Summary of Claimed Subject Matter

Embodiments of the present invention generally are directed to an apparatus and method for providing in-band messaging through a video switch or other functional element forming a multiplexed content stream prior to transport processing and/or transmission of the multiplexed content stream via an in-band communications channel. (See Abstract.)

For the convenience of the Board of Patent Appeals and Interferences, Appellants' independent claims 32 and 40 are presented below in claim format with elements reading on the various figures of the drawings and appropriate citations to at least one portion of the specification for each element of the appealed claims.

Claim 32 positively recites (with reference numerals, where applicable and cites to at least one portion of the specification added):

32. In an information distribution system *(e.g., Fig. 1, p.3, lines 15-19)* comprising server equipment for providing both content and non-content data to subscriber equipment *(e.g., 106_n, Fig. 1)*, said server equipment comprising:

a multiplex switch *(e.g., 230, Fig. 2; p.9, lines 5-10; p.)*, for multiplexing a plurality of formatted content data from server modules *(e.g., 220, Fig. 2, p.9, line 5)* to produce an output stream that is adapted for transport to the subscriber equipment *(e.g., 106, Fig. 1)*, via a communication channel, wherein said multiplexing of said formatted content data is statistically performed; said multiplex switch comprises a converter module *(e.g., 232, Fig. 3)* for formatting non-content data and a switching module *(e.g., 234, Fig. 3)*, for selectively multiplexing formatted non-content data into said output stream, wherein said multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on said multiplexing of said formatted content streams; and

a transport processor *(e.g., 150, Fig. 1; p.5, lines 17-18)* coupled to the multiplex switch for receiving the output stream from the multiplex

switch and for transmitting to the multiplex switch reverse data channel information received via a reverse data channel. *(e.g., p.5, lines 30-1; p.7, lines 3-13; p.9, lines 5-10, lines 32-34)*

Claim 40 positively recites (with reference numerals, where applicable and cites to at least one portion of the specification added):

40. A method *(e.g., Fig. 4)* of providing content and non-content data to subscriber comprising the steps of:

statistically multiplexing a plurality of formatted content streams to produce an output stream that is adapted for transport to the subscriber via a communication channel; *(e.g., Fig. 4, step 404; p.15, lines 8-11; p.13, lines 7-11)*

formatting non-content data to fit the output stream;

predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; *(e.g., Fig. 4, step 410; p.13, lines 7-11)*

selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis; *(e.g., Fig. 4, step 412; p.15, lines 6-15)*

receiving reverse data channel information. *(e.g., Fig. 1; p.7, lines 3-9)*

Grounds of Rejection to be Reviewed on Appeal

The Examiner has rejected claims 32-44 under 35 U.S.C. §103(a) as being unpatentable over Mao et al. (U.S. 6,886,178, hereinafter "Mao") in view of Wu et al. (U.S. 6,594,271, hereinafter "Wu") and further in view of O'Loughlin et al. (U.S. 6,185,635, hereinafter "O'Loughlin").

ARGUMENTS

The Examiner has rejected claims 32-44 under 35 U.S.C. §103(a) as being unpatentable over Mao in view of Wu and further in view of O'Loughlin. Appellants respectfully traverse the rejection because Mao, Wu and O'Loughlin, singly or in combination, fail to teach or suggest Appellants' invention as a whole.

Mao and Wu

As stated on pages 7-8 of the Final Office Action of March 16, 2007 (hereinafter, "Final Office Action"), Mao does not disclose "multiplexing of content streams is statistically performed, and wherein the multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on the multiplexing of the formatted content streams."

The Examiner thus relied on Wu's process of bandwidth allocation using the Opportunistic Data Processor (ODP) as teaching the above features missing in Mao.

No Motivation to combine Mao with Wu

The Examiner stated that a motivation to combine Mao with Wu is taught by Wu (col. 3, lines 59-61), namely, to maximize bandwidth utilization, provide cost saving and minimize disruption to the existing encoders in the field.

Appellants submit, however, that there is no motivation to combine Mao with Wu because Mao's teaching would not have suggested Wu's approach of using an opportunistic data processor (ODP) for transmitting data such as the master control map, HTML Program Association Table (HPAT), taught in Mao.

Mao teaches that three tables contained in a control map, i.e., non-content data, are needed in order to allow a viewer to navigate among the broadcast and simulcast HTML pages (e.g., Mao, col. 3, lines 42-59). The master control map, HPAT, defines the locations of two other tables (HPMT and HEIT), and is provided in a predetermined data packet within a MPEG-2 data stream (e.g., Mao, col. 3, lines 62-67). Once the HPAT is found by the set-top, the other

tables containing broadcast or simulcast Web pages can be found based on information in HPAT.

Since HPAT is required for locating the other two tables (HPMT and HEIT), it would not be obvious to insert such a table in an opportunistic data stream based on bandwidth availability. Instead, as Mao clearly teaches, this table has to be provided in a predetermined data packet so that it can be found by the set-top, and thus, allow retrieval of the other tables to find desired broadcast or simulcast Web pages (e.g., Mao, col. 7, lines 41-43)

As such, Applicants submit that there is no motivation to send Mao's HPAT table on an opportunistic, bandwidth available basis, when Mao teaches that it should be sent in a predetermined data packet.

Appellants submit, however, that even if combined, Mao and Wu would not have resulted in the above cited features for the following reasons.

The present invention discloses that the switching module 234 may be able to predict future bandwidth availability and, therefore, give priority to IP packets over video and audio MPEG packets. (See Specification: page 13, lines 8-21.) Specifically, the future bandwidth is predicted based on the multiplexing of the formatted content packets. The prediction allows the formatted non-content data to be multiplexed into an output stream based on anticipated future bandwidth conditions, i.e., irrespective of the current bandwidth condition.

The present claims explicitly include the features of predicting the available bandwidth at a future time and using that information in selective multiplexing, e.g., "wherein said multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on said multiplexing of said formatted content streams" as recited in claim 32, and "predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis" as recited in claim 40.

Wu fails to bridge the substantial gap between Mao and Appellants' invention because Wu also does not suggest or teach the above claimed features.

The Examiner stated on page 8 of the Final Office Action that the ODP in Wu provides formatted opportunistic data for multiplexing only **after** the available/spare bandwidth is determined and bandwidth allocation for formatted opportunistic data is received, and that the Television Service Processors (TSPs) also provide encoded source data for multiplexing **after** bandwidth allocations are assigned, citing Wu's col. 2, lines 13-38; col. 4, lines 38-47; col. 5, lines 10-52; and col. 6, lines 17-27.

The Examiner thus interpreted Appellants' claimed feature of "multiplexing of content streams is statistically performed" as being taught by Wu's multiplexing of opportunistic data only when total bandwidth used for encoded video streams by all the TSPs drops below threshold (page 8, Final Office Action).

The Examiner further interpreted Appellants' claimed feature of "selectively multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on the multiplexing of the formatted content streams" as being taught by Wu's "selectively multiplexing formatted opportunistic data into the bandwidth allocation for later multiplexing the formatted opportunistic data into the stream that is predicted/determined and then allocated for formatted opportunistic data after calculating the bandwidth for encoded source data and spare/available bandwidth" (pages 8-9, Final Office Action).

Appellants disagree. Specifically, providing data <u>after</u> bandwidth determination/allocation as taught by Wu is not equivalent to <u>predicting future bandwidth availability</u>. Predicting future bandwidth availability implies anticipating the availability of bandwidth at a time in the future. It is not the same as determining/allocating <u>current</u> bandwidth availability for providing data at a future time. Specifically, Wu is silent on predicting <u>future</u> bandwidth availability.

Wu does not calculate, determine, forecast, estimate, anticipate or predict what the bandwidth condition will be like in the future and multiplex data with respect to that prediction.

Instead, the ODP in Wu sends its bandwidth need parameter to a quantization level processor (QLP) according to whether a global quantization level (QL) is below a threshold quantization level, and in response, the QLP provides bandwidth allocations to the channel encoders and the ODP (col. 2, lines 13-38). Furthermore, Wu teaches that "the ODP 162 "tricks" the QLP 130 into assigning it bandwidth only when the ODP 160 determines that excess (spare) bandwidth that is not being used by the TSPs is available" (col. 6, lines 20-23), and "[i]f the global QL value drops below the threshold (e.g., QL<5), this means there is spare bandwidth available for the opportunistic data, and the ODP 160 will send a non-zero max_br value to the QLP 130 so that the opportunistic data bandwidth will be upper bounded by max_br" (col. 7, lines 3-7).

Thus, all that Wu teaches is that ODP sends a non-zero need parameter and maximum bandwidth requirement to the QLP based on the ODP's determination of the current bandwidth availability as indicated by the current global QL value.

As such, the combined teaching of Mao and Wu does not teach "predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams; and selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis," as provided in Appellants' claims 32 and 40.

Mao, Wu and O'Loughlin

The Examiner further stated that Mao in view of Wu does not specifically disclose "a transport processor coupled to multiplexer switch for transmitting to the multiplexer switch reverse data channel information received via a reverse data channel" (page 9, Final Office Action).

Thus, the Examiner relied on O'Loughlin's Figs. 1-5 and col. 6, line 52 to col. 9, line 54 as disclosing "data transport system 12 coupled to bi-directional multiplexors 18, 24, 16 for receiving output content from bi-directional multiplexors 18, 24, 26 and for transmitting to bi-directional multiplexors 18, 24, 26 reverse channel information received via data transport system 14, 16 multiplexors 20, 22, 28" (page 9, Final Office Action).

Examiner further stated that Mao teaches, in Fig. 1; col. 6, lines 15-59, the features of a "multiplex switch for multiplexing a plurality of formatted content data from server modules to produce an output stream that is adapted for transport to the subscriber equipment via a communication channel" (page 7, Final Office Action).

However, Appellants disagree that the teaching of O'Loughlin, when combined with Mao and Wu, would result in Appellants' claimed invention.

Specifically, the cited portions of O'Loughlin disclose a data transportation environment, in which consumers are connected, directly or indirectly, to respective bidirectional converters (multiplexers) 18, 24 or 26, which are in turn connected to data transport system 12 (see O'Loughlin, Fig. 1).

If Mao's multiplex switch (e.g., Mao, Fig. 1, MPEG REMUX 14) were to be modified in the manner taught by O'Loughlin, i.e., connecting the multiplex switch and transport processor as shown in O'Loughlin's data transport system 12 and multiplexers 18, 24 and 26, one would arrive at a system configuration that is different from Appellants' claimed invention.

For example, Appellants' server equipment provides data to subscriber equipment, with the multiplex switch and transport processor coupled such that the multiplexed output is received by the transport processor for transport to subscriber equipment. This corresponds to the claimed features:

> "multiplex switch for multiplexing a plurality of formatted content data from server modules to produce an output stream that is adapted for transport to the subscriber equipment via a communication channel" (recited in claim 32); and

"statistically multiplexing a plurality of formatted content streams to produce an output stream that is adapted for transport to the subscriber via a communication channel" (recited in claim 40).

By contrast, the multiplexed data in O'Loughlin is actually information from the consumer equipment being provided to the data transport system 12 (O'Loughlin's Fig. 1). Thus, unlike Appellants' invention, the multiplexed output as modified according to O'Loughlin, would have been provided in a direction opposite to that of Appellants' invention (i.e., from the subscribers, instead of to the subscribers).

Furthermore, the transport processor of the claimed invention is configured such that the reverse data channel information, i.e., information from the subscribers, is received by the transport processor for transmitting to the multiplex switch. This is illustrated in Appellants' FIG. 1 and p. 5, lines 17- 21 of the specification.

Again, O'Loughlin's Fig. 1 teaches that information from the subscribers is sent by the multiplexers 18, 24 and 26 to the data transport system 12. Thus, if Mao were to be combined with O'Loughlin's teaching, one would have resulted in reverse data channel from subscribers being sent to the multiplexer for transmitting to the transport processor, which is opposite to Appellants' claimed invention.

Therefore, even if O'Loughlin were to be combined with Mao and Wu, one would still not have resulted in Appellants' invention, as recited in either claim 32 or 40.

Thus, Mao, Wu and O'Loughlin, singly or in combination, fail to teach or suggest the invention as a whole. As such, Appellants submit that independent claims 32 and 40 are not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder.

Furthermore, claims 33-39 and 41-44 respectively depend from independent claims 32 and 40 and recite additional limitations thereof. As such, and at least for the same reasons as discussed above, Appellants submit that these dependent claims are also not obvious and fully satisfy the requirements of

35 U.S.C. §103 and are patentable thereunder. Therefore, Appellants respectfully request that the Examiner's rejections be withdrawn.

As for dependent claims 36 and 37, Appellants further submit that the sections of Mao cited by the Examiner (pages 11-12, Final Office Action), namely, Figures 1-4, 7; col. 6, lines 26-64; col. 7, lines 1-67, do not teach the claimed features of "wherein said multiplex switch preferentially multiplexes said non-control data" recited in claim 36, or "wherein said multiplex switch preferentially multiplexes said control data" recited in claim 37.

As taught in Appellants' specification, e.g., p. 13, lines 15-20, "preferentially multiplex" means prioritize. Appellants submit that Mao only teaches transmitting multiplexed output that includes control maps and broadcast and simulcast web pages in a data carousel, and there is no specific teaching regarding preferentially multiplexing certain types of data over others. For this additional reason, dependent claims 36 and 37 are also patentable under 35 U.S.C. §103 over the cited references.

CONCLUSION

Thus, Appellants submit that all of the claims presently in the application are allowable under the provision of 35 U.S.C. §103.

For the reasons advanced above, Appellants respectfully urge that the rejection of claims 32-44 is improper. Reversal of the rejection of the Final Office Action is respectfully requested.

Respectfully submitted,

10/2/07
Date

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CLAIMS APPENDIX

32. (Previously Presented) In an information distribution system comprising server equipment for providing both content and non-content data to subscriber equipment, said server equipment comprising:

a multiplex switch for multiplexing a plurality of formatted content data from server modules to produce an output stream that is adapted for transport to the subscriber equipment via a communication channel, wherein said multiplexing of said formatted content data is statistically performed; said multiplex switch comprises a converter module for formatting non-content data and a switching module for selectively multiplexing formatted non-content data into said output stream, wherein said multiplexing of formatted non-content data is on a future bandwidth availability basis that is predicted based on said multiplexing of said formatted content streams; and

a transport processor coupled to the multiplex switch for receiving the output stream from the multiplex switch and for transmitting to the multiplex switch reverse data channel information received via a reverse data channel.

33. (Previously Presented) The server equipment of claim 32, wherein said multiplex switch includes a buffer for storing non-content data and a switch controller for determining a bandwidth utilization level of said multiplex switch, said switch controller further for causing at least a portion of said non-content data in said buffer to be multiplexed into said output stream when said bandwidth utilization level falls below a threshold utilization bandwidth level.

34. (Previously Presented) The server equipment of claim 33, wherein said threshold bandwidth utilization level comprises a utilization level sufficient to process a single time extent, wherein said content streams are divided into a plurality of respective time extents.

35. (Previously Presented) The server equipment of claim 33, wherein each of said content streams is divided into a plurality of respective time extents, and wherein said multiplex switch can multiplex a predefined number of time extents into said output stream.

36. (Previously Presented) The server equipment of claim 32, wherein said non-content data comprises control data and non-control data, and wherein said multiplex switch preferentially multiplexes said non-control data.

37. (Previously Presented) The server equipment of claim 32, wherein said non-content data comprises control data and non-control data, and wherein said multiplex switch preferentially multiplexes control data.

38. (Previously Presented) The server equipment of claim 32, wherein said content data includes MPEG data.

39. (Previously Presented) The server equipment of claim 32, wherein said non-content data includes internet protocol data.

40. (Previously Presented) A method of providing content and non-content data to subscriber comprising the steps of:

statistically multiplexing a plurality of formatted content streams to produce an output stream that is adapted for transport to the subscriber via a communication channel;

formatting non-content data to fit the output stream;

predicting future bandwidth availability based on the statistical multiplexing of the formatted content streams;

selectively multiplexing formatted non-content data into said output stream on a future bandwidth availability basis; and

receiving reverse data channel information.

41. (Previously Presented) The method of claim 40 further including storing non-content data until bandwidth availability enables multiplexing of the stored non-content data.

42. (Previously Presented) The method of claim 40, furthering including dividing content streams into a plurality of respective time extents that are multiplexed a predefined number at a time into the output stream.

43. (Previously Presented) The method of claim 40 wherein the output stream is an MPEG data stream.

44. (Previously Presented) The method of claim 40 further including receiving the non-content data in an internet protocol format.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None